Complete Summary

GUIDELINE TITLE

Role of noninvasive testing in the clinical evaluation of women with suspected coronary artery disease.

BIBLIOGRAPHIC SOURCE(S)

Mieres JH, Shaw LJ, Arai A, Budoff MJ, Flamm SD, Hundley WG, Marwick TH, Mosca L, Patel AR, Quinones MA, Redberg RF, Taubert KA, Taylor AJ, Thomas GS, Wenger NK. Role of noninvasive testing in the clinical evaluation of women with suspected coronary artery disease: consensus statement from the Cardiac Imaging Committee, Council on Clinical Cardiology, and the Cardiovascular Imaging and Intervention [trunc]. Circulation 2005 Feb 8;111(5):682-96. [168 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Coronary artery disease (CAD)

GUIDELINE CATEGORY

Diagnosis
Evaluation
Risk Assessment

CLINICAL SPECIALTY

Cardiology
Family Practice
Internal Medicine

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To provide a synopsis of available evidence about noninvasive cardiac testing modalities in the diagnosis and risk assessment of both the symptomatic and asymptomatic woman patient with suspected coronary artery disease (CAD)

TARGET POPULATION

Women with suspected coronary artery disease (CAD)

INTERVENTIONS AND PRACTICES CONSIDERED

Risk Assessment/Diagnosis/Evaluation

1. Resting 12-lead electrocardiography (ECG)
2. Exercise electrocardiography (treadmill test)
3. Stress echocardiography (dobutamine or exercise)
4. Cardiac radionuclide imaging: stress myocardial gated perfusion single-photon emission computed tomography (SPECT) imaging (exercise or pharmacological stress)

MAJOR OUTCOMES CONSIDERED

- Predictive value of diagnostic tests
- Sensitivity and specificity of diagnostic tests
- Prognostic value of tests
- Incidence of false-negative and false-positive results
- Survival rate
- Coronary artery calcium

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Guideline developers searched English language manuscripts including original manuscripts and meta-analyses published from 1970 to 2005 that adhered to the American College of Cardiology/American Heart Association (ACC/AHA) guidelines.

NUMBER OF SOURCE DOCUMENTS

200

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Expert peer review of American Heart Association (AHA) Scientific Statements is conducted at the AHA National Center. For more on AHA statements and guidelines development, visit http://www.americanheart.org/presenter.jhtml?identifier=3023366.

This statement was approved by the AHA Science Advisory and Coordinating Committee on December 23, 2004.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Recommendations for Noninvasive Testing in Women with Suspected Coronary Artery Disease (CAD)

For women with a normal resting electrocardiography (ECG) and good exercise tolerance, evidence supports the recommendation from the American College of Cardiology/American Heart Association (ACC/AHA) guidelines for a routine exercise treadmill test as the initial test for the evaluation of suspected CAD. Combining parameters such as exercise capacity and heart rate changes with the traditional evaluation of ST-segment changes improves the prognostic accuracy of the exercise treadmill test, making it a cost-efficient modality to use in this group of women (see Figure 1 in the original guideline document).

The indications for cardiac imaging in symptomatic cohorts of women are summarized in Figure 2 in the original guideline document. Cardiac imaging is recommended for symptomatic women with established CAD. Current evidence and practice guidelines recommend cardiac imaging for women with suspected CAD with an abnormal resting 12-lead ECG. More widespread use may be justified, but data are insufficient to support the primary use of imaging tests in all female patients. Cardiac imaging is recommended for women with an indeterminate or intermediate-risk exercise ECG test, as well as those with an intermediate-risk Duke treadmill score.

Although not considered in the current ACC/AHA guidelines, diabetic women merit special consideration and are included in the present statement as candidates for cardiac imaging because they have a risk of cardiovascular death that is up to 8-fold higher than that of non-diabetic women. As outlined in Figure 2 in the original guideline document, additional candidates for cardiac imaging include other intermediate- to high-risk groups with functional impairment that are suitable for pharmacological stress. On the basis of a growing body of evidence, cardiac imaging via contemporary techniques of stress echocardiography or gated single-photon emission computed tomography (SPECT) myocardial perfusion imaging provides accurate diagnostic and prognostic information for women with suspected ischemic symptoms. Additional special populations of women who also may be at risk include women with the metabolic syndrome and those with polycystic ovary syndrome, although definitive imaging evidence is not available.

On the basis of existing evidence, the asymptomatic woman with a calcium score $\geq$400 has an annualized risk of CAD death or myocardial infarction (MI) of approximately 2% and should be considered at high cardiac risk. This

recommendation is supported by the recently published AHA guidelines on CAD prevention in women, which noted that a 2% risk of major adverse cardiac events places a patient at high risk. Thus, many experts advocate that women with significant subclinical atherosclerosis should be treated with secondary prevention goals, although definitive randomized trial evidence is not available.

Conclusion

A review of the data suggests that, as in men, women with suspected and known CAD can be accurately diagnosed and risk-stratified via contemporary cardiac imaging techniques. Despite this, an abundance of evidence still suggests that women at risk for CAD are less often referred for the appropriate diagnostic test than are men. The present approaches to diagnostic testing may require some variation when applied to women, and ongoing investigation is needed to fully appreciate the multifactorial role of reproductive hormones on the vascular system and diagnostic testing. Additional work also is needed to fully assimilate sex-specific issues into clinical guidelines and everyday clinical practice when appropriate. The data reviewed here, however, suggest that women benefit from risk stratification with commonly used noninvasive cardiac tests. Local expertise and availability should guide the selection of cardiac imaging techniques in women with suspected and known CAD who are candidates for cardiovascular screening.

CLINICAL ALGORITHM(S)

An algorithm is provided in the original guideline document for the evaluation of symptomatic women using exercise electrocardiography (ECG) or cardiac imaging.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated.

Much of the evidence supporting contemporary recommendations for noninvasive diagnostic studies in women is extrapolated from studies conducted predominantly in cohorts of middle-aged men.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Timely and accurate diagnosis can significantly reduce coronary artery disease (CAD) mortality for women; indeed, once the diagnosis is made, it does appear that current treatments are equally effective at reducing risk in both women and men.
- The diagnosis of coronary artery disease (CAD) and assessment of potential risk of cardiovascular disease are crucial steps toward improving outcomes. Thus, noninvasive diagnostic and prognostic testing offers the potential to identify women at increased coronary artery disease risk and establish the basis for instituting preventive and therapeutic interventions.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Beyond a single study, no other study has included sufficient numbers of women to make confident statements about the incremental value of coronary artery calcium (CAC) testing.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Mieres JH, Shaw LJ, Arai A, Budoff MJ, Flamm SD, Hundley WG, Marwick TH, Mosca L, Patel AR, Quinones MA, Redberg RF, Taubert KA, Taylor AJ, Thomas GS, Wenger NK. Role of noninvasive testing in the clinical evaluation of women with suspected coronary artery disease: consensus statement from the Cardiac Imaging Committee, Council on Clinical Cardiology, and the Cardiovascular Imaging and Intervention [trunc]. Circulation 2005 Feb 8;111(5):682-96. [168 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2005 Feb 8

GUIDELINE DEVELOPER(S)

American Heart Association - Professional Association

SOURCE(S) OF FUNDING

American Heart Association

GUIDELINE COMMITTEE

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Council on Clinical Cardiology
Cardiovascular Imaging and Intervention Committee
Council on Cardiovascular Radiology and Intervention

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The American Heart Association (AHA) makes every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

Writing Group Disclosures

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This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on Disclosure Questionnaire, which all members of the writing group are required to complete and submit.

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This table represents the relationships of reviewers that may be perceived as actual or reasonably perceived conflicts of interest as reported on Disclosure Questionnaire, which all reviewers of the statement are required to complete and submit.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Heart Association Web site.

Print copies: Available from the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596; Phone: 800-242-8721

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 17, 2005. The information was verified by the guideline developer on June 15, 2005.

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